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LORAIN

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instructions

INSTALLATION

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DESIGNERS AND MANUFACTURERS OF

power equipment without moving parts SUB-CYCLE® CONVERTERS AND FLOTROL® RECTIFIERS

CST2

FLOTROL

TRANSISTORIZED
CARRIER SUPPLY

SPEC 834-01 SERIAL NO 510

INSTRUCTIONS AND CIRCUIT DESCRIPTION
MODEL CST2 CARRIER SUPPLY UNIT
SD-1030-01

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LORAIN PRODUCTS CORPORATION
Lorain, Ohio, U.S.A.

LORAIN PRODUCTS (CANADA) LTD.
St. Thomas, Ontario, Canada

Form 890

INSTRUCTIONS AND CIRCUIT DESCRIPTION
MODEL CST2 CARRIER SUPPLY
SD-1030-01

1. RATINGS

Input: 46-52 volts d-c, 0.72 ampere

Output: 130 volts d-c, 0.150 ampere

2. DESCRIPTION

The Model CST2 Carrier Supply supplies 130 volt d-c output from a nominal 48 volt d-c power source. This enables operation of the Carrier Supply from battery rather than from a-c power lines so that carrier service is maintained despite a-c power failure.

Carrier Supply output voltage is regulated for variations in both input voltage and load current.

3. INSTALLATION

a. Mounting

The Model CST2 Carrier Supply is designed for 19 inch relay rack mounting. It requires 3-1/2 inches panel space and extends 6 inches to the rear of the rack. Its overall depth is 6-7/8 inches.

CAUTION: In mounted position, the ventilating perforations at top and bottom of the Carrier Supply rear cover must be unobstructed. This is essential for proper cooling during operation.

b. Electrical connections

To gain access to the input-output terminal strip, remove the rear cover from the Carrier Supply. The terminal strip is located at the left hand side of the unit, as viewed from the rear. An insulating bushing provides lead entrance.

(1) Insert 130 volt carrier supply load circuit leads through the bushing and connect as follows: + terminal 3; - terminal 4.

3. b. (continued)

(2) Insert alarm leads (if desired) through the bushing and connect either to terminals 5 and 6 or 7 and 8. Either set of terminals supplies a closed loop to operate an alarm if Carrier Supply output failure occurs. When two or more Carrier Supply Units are connected in parallel, one set of alarm terminals in each unit can be connected in series to operate a major alarm. The Carrier Supply ALARM LAMP will light under alarm conditions if negative battery is connected at terminal 9.

(3) Insert input battery leads through the bushing and connect as follows: + ground, terminal 2; - battery, terminal 1.

CAUTION: Input battery polarity is critical. Improper input polarity will damage the Carrier Supply.

4. OUTPUT VOLTAGE ADJUSTMENT

Output voltage is adjustable between approximately 120-140 volts. To gain access to this adjustment, remove Carrier Supply rear cover, remove two nuts and flatwashers which retain resistor and diode panel, and pivot panel outward on hinge at right hand side. To increase output voltage, turn the potentiometer R9 screwdriver adjustment shaft clockwise. Unless otherwise specified, output voltage is adjusted to 130 volts at the factory. Allow 15 minutes operation before adjusting output voltage to be certain that transistors are completely warmed up.

5. OPERATION

a. Output current failure

When so connected, an output failure alarm relay in the Carrier Supply will operate alarms to indicate output voltage failure. This relay also lights an indicator lamp on the Carrier Supply under alarm conditions.

b. Input fuse

A fuse, in a bayonet-type fuseholder at upper front of the Carrier Supply Unit, protects the input circuit. If this fuse opens, overload or some unsatisfactory condition in the Carrier Supply is indicated. Replace the input fuse only with a Bussmann type MDL 1 ampere fuse, or equivalent.

6. CIRCUIT DESCRIPTION

a. Input filter

Choke L1 and capacitor C4 form a filter network which blocks noise originating in the Carrier Supply from the talking battery.

b. Voltage regulator

Collector voltage for the oscillator circuit described below, hence Carrier Supply output voltage, is regulated by transistors Q1 and Q2, Zener diode CR1, resistors R1, R2, R3, R4, and R10, potentiometer R9, and capacitor C1.

When input battery is first connected, negative voltage is applied through R1 to the Q1 collector and through R2 to the Q1 base. This causes Q1 to conduct. Current then flows from positive battery through R10, R9, R3, the Q1 emitter and collector, and R1 to negative battery. Negative voltage developed across R10 and part of R9 is applied to the Q2 base, causing Q2 to conduct.

When Q2 conducts, it applies an inverse voltage across CR1. CR1 then conducts in the reverse direction; once this occurs, a relatively constant voltage is developed across CR1. Q2 conducts until its base voltage is equal to the constant CR1 voltage at its emitter. This holds Q2 collector voltage constant. Constant Q2 collector voltage applied to the Q1 base causes Q1 to conduct until its emitter voltage equals its base voltage.

If input voltage increases, Q1 emitter voltage also increases momentarily, and the resulting increase in Q2 base voltage drives Q2 to greater conduction, decreasing negative voltage at the Q1 base. This decreases conduction in Q1 and reduces Q1 emitter voltage, as necessary to hold oscillator collector voltage constant.

As load current increases, voltage developed across part of R4 increases. R4 voltage is added to the constant CR1 voltage to slightly increase output voltage of the voltage regulator. R4 is adjusted at the factory to compensate for increased voltage drop in the power rectifier as load increases, and hold Carrier Supply output voltage constant for varying load.

Due to switching transients developed in the oscillator, voltage applied to the Q2 base from R9 has some ripple voltage superimposed. C1 by-passes this ripple voltage to the Q1 emitter so it will not affect voltage regulation.

6.

c. Oscillator

Transistors Q3 and Q4, diodes CR2 and CR3, resistors R5, R6, R7, R8, R11, and R12, capacitors C2 and C3, and the primary and feedback windings of saturable transformer T1 form the oscillator.

When the voltage regulator first operates, it applies negative voltage through R11 to the Q4 base and causes Q4 to conduct. Current then flows from positive voltage regulator output through Q4 emitter, the T1 primary, and R5 to negative voltage regulator output. This induces voltages in the T1 feedback windings: one feedback winding applies negative voltage through R8 to the Q4 base and increases Q4 conduction, the other feedback winding applies positive voltage through R7 to the Q3 base and drives Q3 to cut-off.

Once started, current through the above circuit increases rapidly until the T1 core is saturated. A voltage developed across the Q4 emitter and collector then causes decay of T1 primary current to reverse feedback voltage polarity. This drives Q3 to conduction and Q4 to cut-off. Current then flows from positive voltage regulator output through R6, the opposite direction through the T1 primary, Q3 emitter and collector to the negative voltage regulator output.

As above, this current increases rapidly until the T1 core is saturated in the opposite direction. Voltage developed across the Q3 emitter and collector again causes decay of T1 primary current and another similar reversal of current.

With the oscillator cycle in progress, C2 and C3 provide an a-c path rather than R5 and R6. CR2 and CR3 clip inverse voltage spikes generated in the T1 primary from the Q3 and Q4 emitters and collectors. R12, between the Q4 collector and base, balances the effect of R11 between the Q3 collector and base.

d. Power rectifier and output circuit

Alternating T1 primary current caused by the oscillator induces a-c in the two T1 secondaries. The secondaries are connected in series to apply a-c to a full-wave bridge rectifier composed of diodes CR4, CR5, CR6, and CR7.

D-c from the above rectifier is filtered by capacitors C5 and C6 with choke L2, and applied through diode CR8 and the load circuit. CR8 permits parallel connection of more than one Carrier Supply.

6. d. (continued)

In event output failure occurs in one unit, CR8 prevents flow of current from the remaining unit through the output circuit of the disabled unit.

e. Output failure alarm

Resistor R13 and the coil of output current failure alarm relay K1 are connected in series across the Carrier Supply output. So long as output voltage is present, relay K1 is held operated.

Absence of output releases relay K1. The relay then shorts terminals 5 to 6 and 7 to 8 of the Carrier Supply input-output terminal strip to operate an alarm, and provides a ground path to light indicator lamp ALARM LAMP.

LORAIN PRODUCTS CORPORATION
Lorain, Ohio, U.S.A.

LORAIN PRODUCTS (CANADA) LTD.
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(continued)

TROUBLESHOOTING
LORAIN MODEL CST2 CARRIER SUPPLY UNIT
SD-1030-01

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LORAIN PRODUCTS CORPORATION
Lorain, Ohio, U.S.A.

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Saint Thomas, Ontario, Canada

TROUBLESHOOTING
LORAIN MODEL CST2 CARRIER SUPPLY UNIT
SD-1030-01

1. GENERAL

These instructions are intended as a guide to test and repair of a LORAIN Model CST2 Carrier Supply Unit.

Paragraph 2 lists possible trouble symptoms. Under each symptom, possibly defective components are described and, in some cases, a test procedure given. In a test procedure which has more than one step, even though an early step reveals a possibly-defective component, all steps should be completed since failure in one component may cause failure of other components.

When trouble has been traced to one or more possibly defective components, suspected components should be checked individually. Paragraph 3 gives test procedures for major components.

2. TROUBLE SYMPTOMS

a. Input fuse F1 opens

(1) Check polarity of input battery connections. If input polarity is incorrect, and jumper which connects positive input to chassis ground has been removed, this will usually damage input capacitor C4 and any or all of transistors Q1, Q2, Q3, and Q4.

(2) Replace fuse F1. If a momentary overload has caused F1 to open, this will correct the symptom; if F1 again opens, some other unsatisfactory condition is indicated.

(3) Shorted capacitor C2 or C3, shorted transistor Q3 or Q4, or shorted diode CR2 or CR3 will also cause input fuse F1 to open, however these components must be tested individually.

b. No output or low output, fuse F1 intact

(1) Disconnect output leads from Carrier Supply Unit. With negative terminal connected at positive (red) terminal of capacitor C5 or C6, measure resistance across capacitor. Initially, this resistance should be low; it should increase as C5 and C6 charge. Continued low resistance shows that C5 or C6 has shorted or that two or more of power rectifier diodes CR4, CR5, CR6, and CR7 have shorted.

2. b. (continued)

(2) With Carrier Supply Unit in operation, note whether or not it emits a high-pitched sound which indicates that transistors Q3 and Q4 are in oscillation.

(3) If Q3 and Q4 are not in oscillation, this can be caused by open resistor R1 or R2, shorted transistor Q2, shorted zener diode CR1, open resistor R4, open resistor R10 or R10 end of potentiometer R9, shorted capacitor C2 or C3, shorted transistor Q3 or Q4, or open resistor R7 or R8. If resistor R11 is open, it is possible that Q3 and Q4 will not start oscillation.

(4) If transistors Q3 and Q4 are in oscillation, check for a-c voltage (approximately 145 volts) between diode CR4-CR5 and CR6-CR7 junctions. No a-c voltage or low a-c voltage indicates an open-circuit or high-resistance connection between secondary windings of power transformer T1 and these points. Lack of d-c voltage (approximately 130 volts) between diode CR4-CR6 junction and diode CR5-CR7 junction shows an open power rectifier diode. With relay K1 operated, an open circuit in wiring, open-circuit in wiring, open-circuit in output choke L2, or an open-circuit in output diode CR8 exists if there is not continuity between diode CR5-CR7 junction and positive output. Lack of continuity between diode CR4-CR6 junction and negative output shows an open-circuit in wiring.

c. High output voltage

This condition can be caused by shorted transistor Q1, open transistor Q2, open zener diode CR1, or open resistor R3 or R3 end of potentiometer R9.

d. Noise at input battery

In general, this symptom is caused by a defective input filter component, choke L1 or capacitor C4.

e. Noise at d-c load

Defective output capacitor C5 or C6, or defective output choke L2 can cause this symptom.

f. Noise in adjacent equipment

This Carrier Supply Unit generates an alternating magnetic field. To correct this condition, move any equipment which would be affected by such a field from vicinity of Carrier Supply Unit.

2. (continued)

f. Noise in adjacent equipment

This Carrier Supply Unit generates an alternating magnetic field. To correct this condition, move any equipment which would be affected by such a field from vicinity of Carrier Supply Unit.

3. MAJOR COMPONENT TEST

a. Capacitors

Any capacitor must be disconnected to test. It is best to measure capacitance of any capacitor suspected to be defective. Nominal capacitance values are given on Schematic Diagram SD-1030-01.

If no capacitance meter is available, with negative terminal of ohmmeter connected at positive (red) terminal of capacitor, measure capacitor resistance. Initially, this resistance should be low; it should increase as capacitor charges. Continued low resistance shows a shorted capacitor. Initial high resistance shows an open capacitor.

b. Chokes

Chokes L1 and L2 should show continuity. Because of normal low resistance, it is difficult to check L1 and L2 for short-circuit. However, with Carrier Supply Unit in operation, if noise at input battery does not increase when choke L1 is shorted, or if noise at d-c load does not increase when choke L2 is shorted, this may indicate a short-circuit.

c. Diodes

To check any diode other than zener diode CR1, disconnect one diode lead and measure diode resistance in both directions. This resistance should be high in one direction and low in the other.

With input battery connected to Carrier Supply Unit and fuse F1 intact, 6.2- to 8.0-volt d-c should appear across zener diode CR1.

If either of diodes CR2 or CR3 is open, check corresponding transistor Q3 or Q4. Diodes CR2 and CR3 protect Q3 and Q4 against inverse voltage spikes.

3. e. (continued)

Since all transformer windings have low resistance, it is difficult to check for short-circuit. Any short-circuited winding will, however, prevent transistors Q3 and Q4 from oscillating.

f. Transistors

Any of transistors Q1, Q2, Q3, or Q4 must be removed to test. To remove any transistor, remove two mounting nuts and collector lead from mounting screws, then withdraw transistor from socket.

To test any transistor for short-circuit, measure its emitter-collector resistance in both directions! this resistance should be greater than zero in both directions; no resistance in both directions shows a shorted transistor. Transistor pin connections are shown in Figure 1, below.

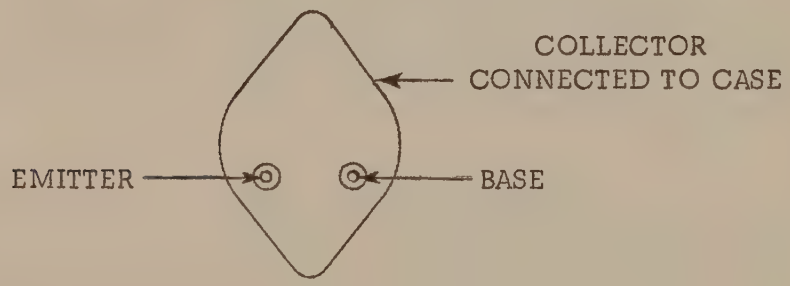

Figure 1. Transistor Connections

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LORAIN PRODUCTS (CANADA) LTD.
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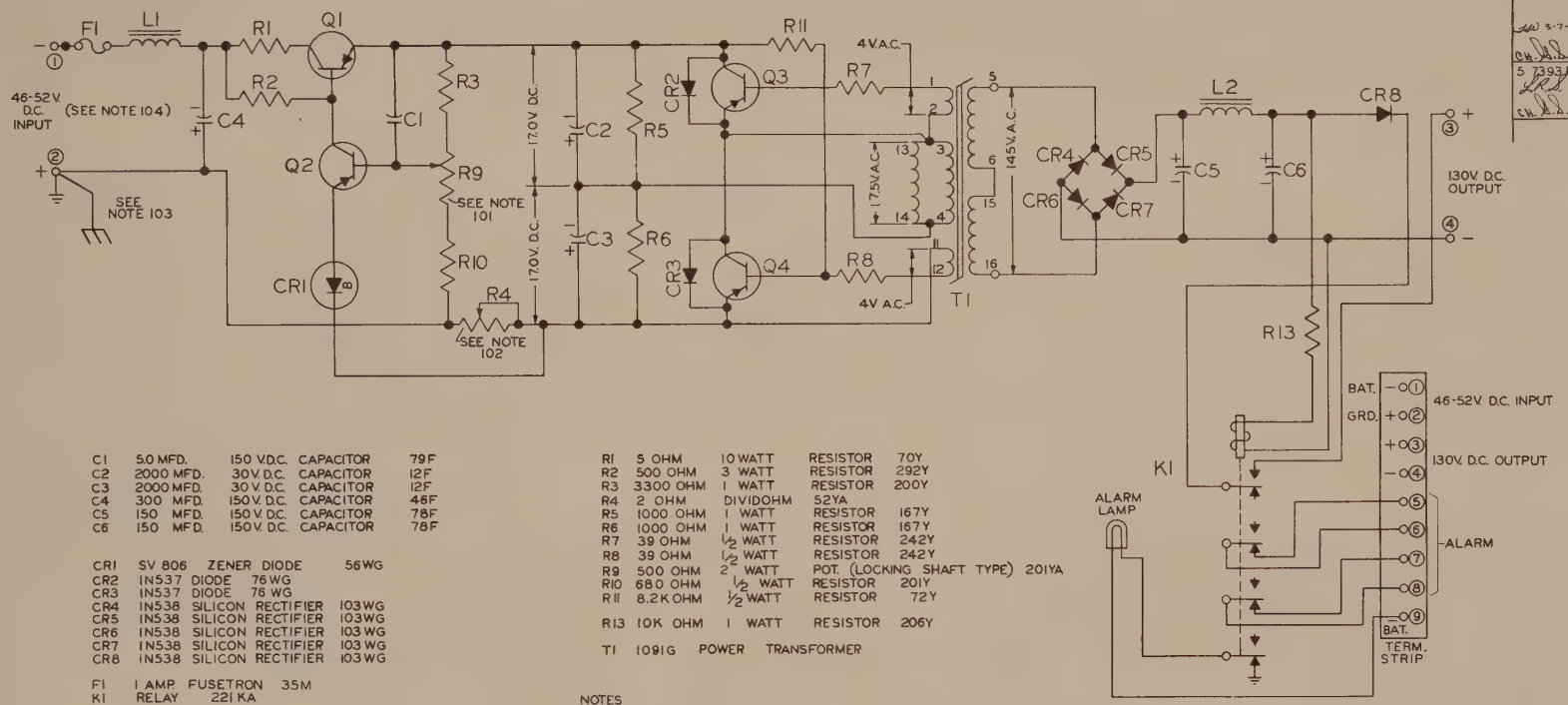
Form 1211

SD-1030-01

RE-185	CHANGE SLIP NO.	DWG CHGD BY	DATE	REVISION
1	4937 RJC	11		R12 REMOVED
		10		R11 CHGD TO 8.2 K Ω BWH 11-11-60
		60		
2	5242 SP	1		F1 WAS 13M
		26		FUSE
		61		BWH 1-30-61
3	5276 RJC	2		GRD. STRAP
		17		ADDED
		61		BWH 2-17-61
4	7315 RAS	3		CR2&3 WERE
		7		IN91 1WG
		62		CR4,5,6,&7 WERE IN602 23WG Q1&2 WERE 2N456 10WH Q3&4 WERE 2N457 8WH BWH 3-7-62
5	7393 RJC	5-4-62		K1 WAS SHOWN OPERATED, NOTE 104 ADDED, R9 WAS 4 WATTS. BWH 5-8-62



C1	5.0 MFD.	150 V.D.C.	CAPACITOR	79F
C2	2000 MFD.	30 V. D.C.	CAPACITOR	12F
C3	2000 MFD.	30 V. D.C.	CAPACITOR	12F
C4	300 MFD.	150 V. D.C.	CAPACITOR	46F
C5	150 MFD.	150 V. D.C.	CAPACITOR	78F
C6	150 MFD.	150 V. D.C.	CAPACITOR	78F

CR1	SV 806	ZENER DIODE	56WG
CR2	IN537	DIODE 76WG	
CR3	IN537	DIODE 76 WG	
CR4	IN538	SILICON RECTIFIER	103WG
CR5	IN538	SILICON RECTIFIER	103WG
CR6	IN538	SILICON RECTIFIER	103 WG
CR7	IN538	SILICON RECTIFIER	103 WG
CR8	IN538	SILICON RECTIFIER	103 WG

F1	1 AMP. FUSETRON	35M
K1	RELAY	221 KA
L1	CHOKE	942G
L2	CHOKE	942G

Q1	2N1535	21WH	TRANSISTOR
Q2	2N1535	21WH	TRANSISTOR
Q3	2N1536	35WH	TRANSISTOR
Q4	2N1536	35WH	TRANSISTOR

R1	5 OHM	10 WATT	RESISTOR	70Y
R2	500 OHM	3 WATT	RESISTOR	292Y
R3	3300 OHM	1 WATT	RESISTOR	200Y
R4	2 OHM	DIVIDOHM		52YA
R5	1000 OHM	1 WATT	RESISTOR	167Y
R6	1000 OHM	1 WATT	RESISTOR	167Y
R7	39 OHM	½ WATT	RESISTOR	242Y
R8	39 OHM	½ WATT	RESISTOR	242Y
R9	500 OHM	2 WATT	POT. (LOCKING SHAFT TYPE)	201YA
R10	680 OHM	½ WATT	RESISTOR	201Y
R11	8.2K OHM	½ WATT	RESISTOR	72Y
R13	10K OHM	1 WATT	RESISTOR	206Y

T1 1091G POWER TRANSFORMER

NOTES

101 RESISTOR R9 PROVIDES OUTPUT VOLTAGE ADJUSTMENT IF DESIRED. (130 VOLTS ± 10 VOLTS) FACTORY SETTING IS AT 130 VOLTS D.C.

102 RESISTOR R4 IS FACTORY SET FOR PROPER OUTPUT VOLTAGE REGULATION.

103 CHASSIS GROUND PROVIDED BY JUMPER AT TERMINAL STRIP, REMOVAL OPTIONAL AFTER TESTING.

104 CONNECT INPUT TO BATTERY SIDE OF FILTER IN PLANTS HAVING DISCHARGE FILTER IN SERIES WITH LOAD.

SCHEMATIC DIAGRAM FOR MODEL CST2 POWER SUPPLY

LORAIN Products Corporation
LORAIN, OHIO
LORAIN PRODUCTS (CANADA) LTD.
ST. THOMAS, ONTARIO

CHECKED BY R.F. Goodrich DATE 10-7-59
APPROVED BY E. Hunter DATE 10/9/59

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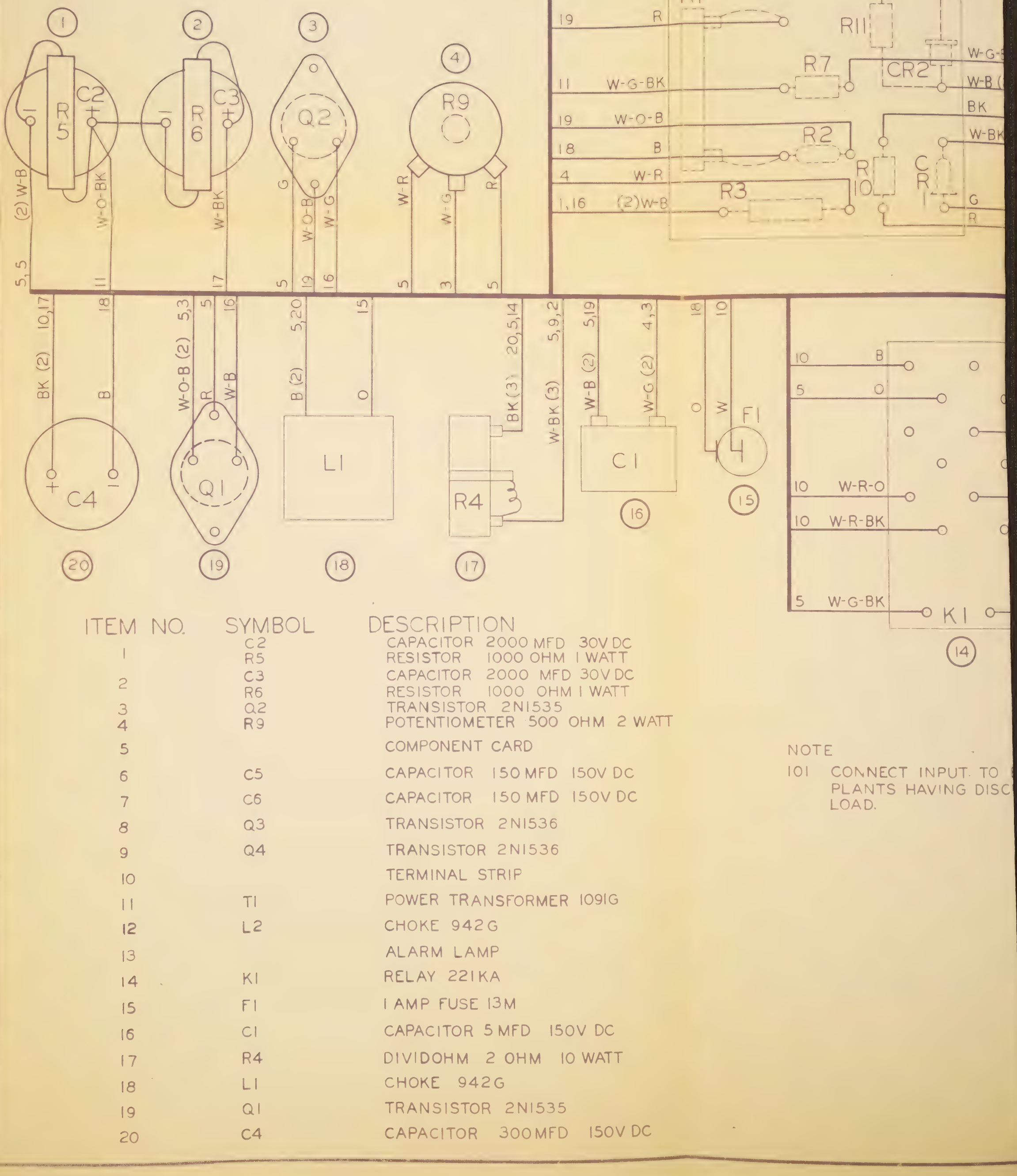
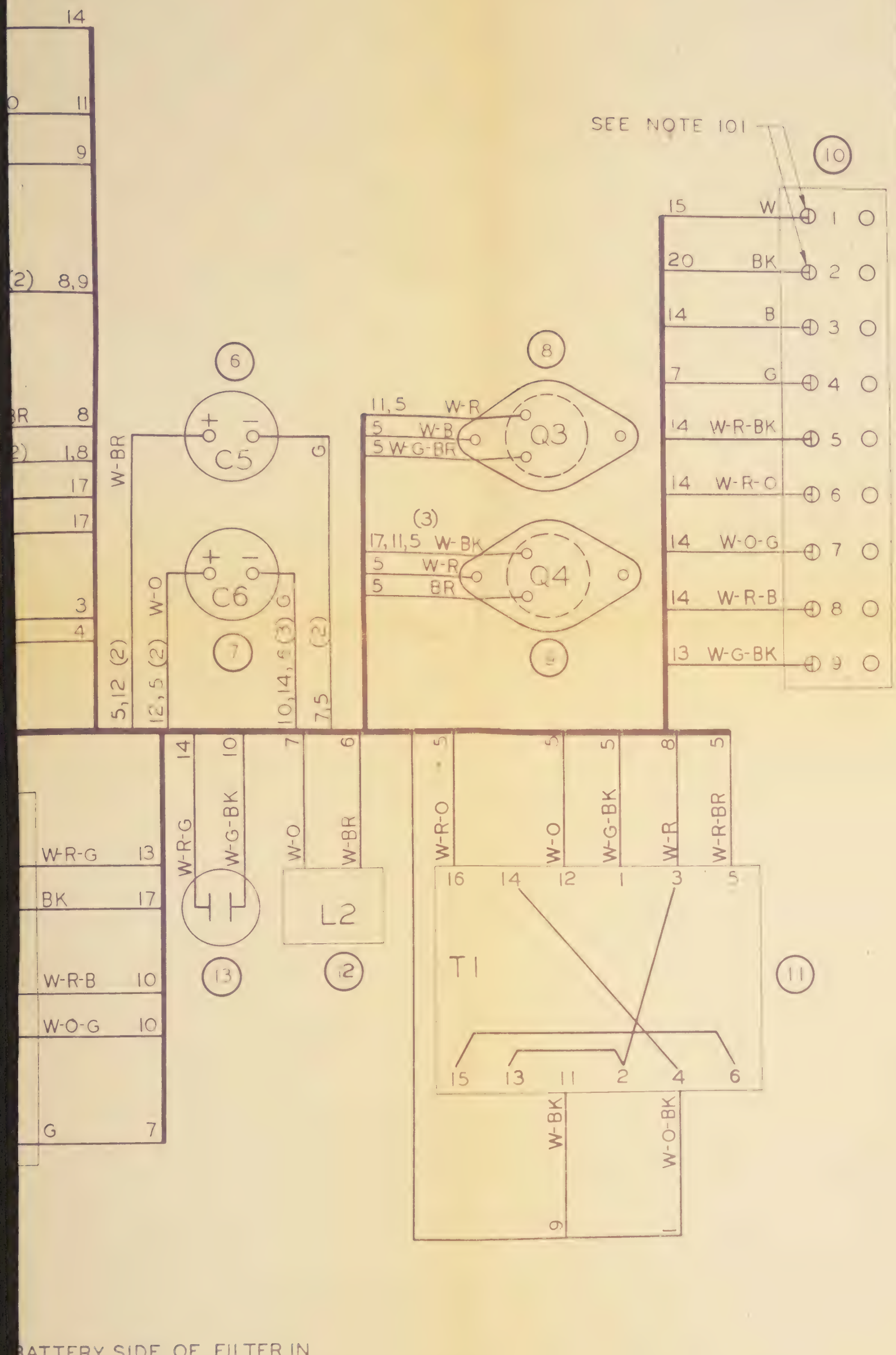


ITEM NO.	SYMBOL	DESCRIPTION
	C2	CAPACITOR 2000 MFD 30V DC
1	R5	RESISTOR 1000 OHM 1 WATT
	C3	CAPACITOR 2000 MFD 30V DC
2	R6	RESISTOR 1000 OHM 1 WATT
3	Q2	TRANSISTOR 2N1535
4	R9	POTENTIOMETER 500 OHM 2 WATT
5		COMPONENT CARD
6	C5	CAPACITOR 150 MFD 150V DC
7	C6	CAPACITOR 150 MFD 150V DC
8	Q3	TRANSISTOR 2N1536
9	Q4	TRANSISTOR 2N1536
10		TERMINAL STRIP
11	T1	POWER TRANSFORMER 1091G
12	L2	CHOKE 942G
13		ALARM LAMP
14	K1	RELAY 221KA
15	F1	1 AMP FUSE 13M
16	C1	CAPACITOR 5 MFD 150V DC
17	R4	DIVIDOHM 2 OHM 10 WATT
18	L1	CHOKE 942G
19	Q1	TRANSISTOR 2N1535
20	C4	CAPACITOR 300 MFD 150V DC

NOTE

101 CONNECT INPUT TO
PLANTS HAVING DISC
LOAD.

2	8TL-2-2-61	AM	2	REDRAWN TO
			2	AGREE TO CHG'D
			61	INDICATED ON C/N
				#3725 & #4937
	CH RD 2-2-61			BWH 2-3-61
3	7315 JL		3	Q1 & Q2 WERE
			7	2N456 10WH.
	LSL 3-8-62		62	Q3 & Q4 WERE
	CH D.D. 3-7-62			2N457 8WH
				BWH 3-12-62
4	7393 JL		5	NOTE 101 ADDED
	JKS 5-3-62		2	R9 WAS 500Ω
	CH. DD. 5-3-62		62	4 WATT POT.
				BWH 5-4-62



BATTERY SIDE OF FILTER IN
HARGE FILTER IN SERIES WITH

TERMINAL DIAGRAM FOR MODEL CST2 POWER SUPPLY

LORAIN *Products Corporation*

LORAIN, OHIO

AND

LORAIN PRODUCTS CANADA, LTD. ST. THOMAS, ONTARIO

DR. BY AGM	DATE 11-15-60	SIZE
CH. BY How	DATE 11-22-60	PART NO.
BY Catelinh	DATE 11-22-60	TD-1030-01
APP. BY BWH	DATE 11-22-60	

Bulletin 181 A

LORAIN

CST UNITS

(carrier supply - transistorized)

Model CST1

For Multiple Channel Systems

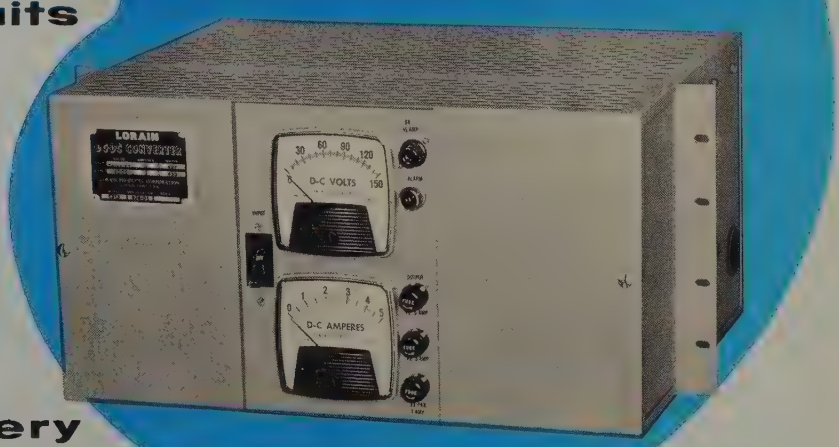
Model CST2

For Single Channel Systems

Model CST3

For Heavy Duty Applications

- Transistor Circuits
- DC to DC
- No Moving Parts
- Operates From Office Battery



Model CST3

LORAIN Products Corporation LORAIN, OHIO

LORAIN PRODUCTS (CANADA) LTD.
ST. THOMAS, ONTARIO

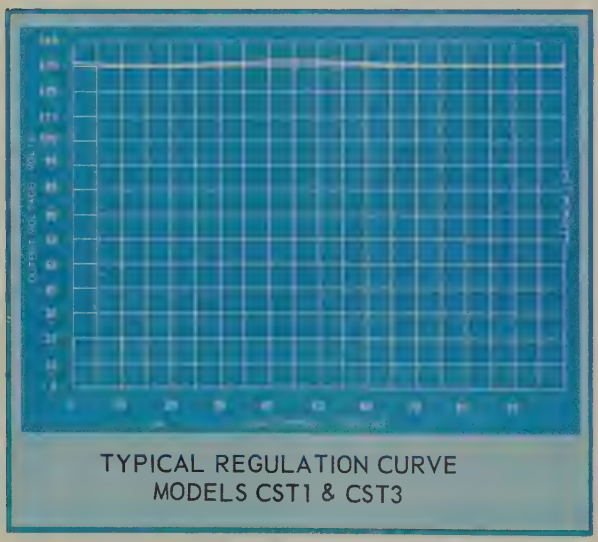
FLOTROL SUB-CYCLE

LORAIN
Transistor Carrier Supply Units

Models CST1, CST2 and CST3 utilize transistorized circuits and are designed for extended, trouble-free, maintenance-free service. These power supply units do not rely on line power but operate from office battery. Built without vibrators or other moving parts, Models CST1, CST2 and CST3 may be subjected to long, continuous service with virtually no deterioration through use.

ELECTRICAL CHARACTERISTICS

Models CST1, CST2 and CST3 supply 2.0, 0.15 and 5.0 amperes of plate current respectively at 130 volts d-c while operating from the 48 volt battery. Full load input current is 9 amperes for Model CST1, 0.80 amperes for CST2 and 17 amperes for CST3. No load input current is 1.5 amperes for CST1, 0.15 amperes for CST2 and 2 amperes for CST3.



TYPICAL REGULATION CURVE
MODELS CST1 & CST3

FIGURE 1

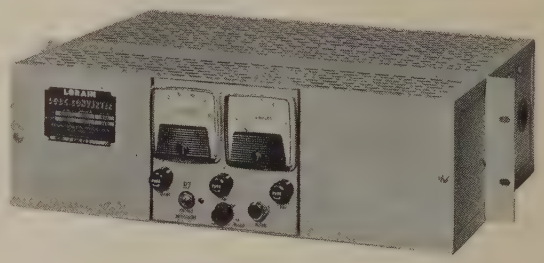
VOLTAGE REGULATION

The excellence of the voltage regulation of the CST1, CST2 and CST3 Models is shown by the regulation curves included in this Bulletin. (See Figures 1 and 6.) Figure 1 shows a typical voltage regulation curve for Models CST1 and CST3, while Figure 6 shows that for Model CST2. Guaranteed output voltage regulation for the CST1 and CST2 is within ± 3% of the 130 volt d-c output under variations of input between 46 and 52 volts and load variations from no load to rated full load. Output regulation for the CST3 is within ± 5% of the 130 volt d-c output from no load to rated full load for input variations from 46 to 52 volts.

CIRCUITRY

Since the CST1, CST2 and CST3 Lorain carrier supply units are independent of commercial a-c power in operation on the office battery, all three give maximum reliability for uninterrupted service.

Models CST1, CST2 and CST3 all utilize transistor oscillator circuits and rugged silicon rectifiers which provide maximum circuit reliability. The circuitry is so arranged in the cabinets of all three models that all replaceable components are readily accessible.



MODEL CST1

FIGURE 2

PARALLELING CIRCUITS

The CST1, CST2 and CST3 Models all have output diodes which permit two units to operate continuously in parallel, either unit supplying the load should the other fail. In addition the output diodes block any possible flow of current from parallel-connected units which would prevent operation of the alarm relay and also prevent the possibility of damage to the remaining units should a fault occur in one unit.

The CST3 includes a paralleling circuit with a fused lead. When two or more CST3 units are operated in parallel for greater output capacity, the paralleling circuit causes each unit to assume its proportionate share of the entire load throughout wide fluctuations in load demand.

MODEL CST2

FIGURE 3

For example, if a peak load of 10 amperes is anticipated, a typical standby assembly would include three CST3 units connected in parallel. With all units operating, each will bear approximately 3.3 amperes. In the event of failure of one unit, the remaining two units in the circuit will then bear 5 amperes each when peak load is encountered.

CIRCUIT PROTECTION

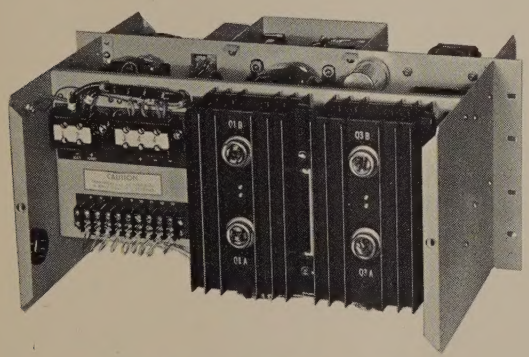
Model CST1 is provided with a 10 ampere input fuse and two 2 ampere output fuses, all three readily accessible from the front of the unit without removing the cover.

The one ampere input fuse for Model CST2 is also arranged for replacement from the front of the unit without removal of the cover.

Input protection for the CST3 is a 19 ampere instantaneous trip breaker. Model CST3 output is protected by a 5 ampere fuse in each side of the line. Both fuses are readily available on the front panel.

ALARM CIRCUITS

Models CST1 and CST3 provide an output failure alarm relay and an alarm lamp fused with an alarm fuse. The circuitry is so arranged that positive ground is supplied to two terminals for external alarm use should a fault occur, while other appropriate terminals become connected so as to complete the circuits for two external closed-circuit alarms if such are desired by the user.



REAR VIEW MODEL CST3

FIGURE 4

Model CST2 has alarm features similar to CST1 and CST3 except that positive ground is not supplied in the event of output fault nor is the alarm lamp fused.

In case of output fault, the alarm relay contacts on Models CST1, CST2 and CST3 apply positive 48 volt ground to light the alarm lamp, which is located conveniently on the front of each unit.

FILTERING

Models CST1, CST2 and CST3 are all provided with generous input filtering to avoid noise in the talking battery. Each is also provided with an output filter to remove noise from the load circuit. The output on all three models is filtered to less than 26 dba with FIA line weighting.

VOLTAGE ADJUSTMENT

In Models CST1 and CST3 the circuit is designed to allow ± 5 volt output adjustment from the nominal output voltage while in Model CST2, approximately ± 10 volt adjustment may be made from the nominal output voltage. Thus, circuit load variation may be readily compensated for. In all three models this adjustment is made by means of a screwdriver shaft.

PHYSICAL CHARACTERISTICS

These transistor carrier supply units are extremely compact. They are designed for 19" relay rack mounting, but alternate mounting brackets are available for mounting the units on larger relay racks if needed. Rack size should be specified on the order.

Model CST1 is 19" in width, 5-7/32" high, 12-1/8" deep and weighs 30 pounds.

Model CST2 is 19" in width, 3-1/2" high, 7" deep and weighs 19 pounds.

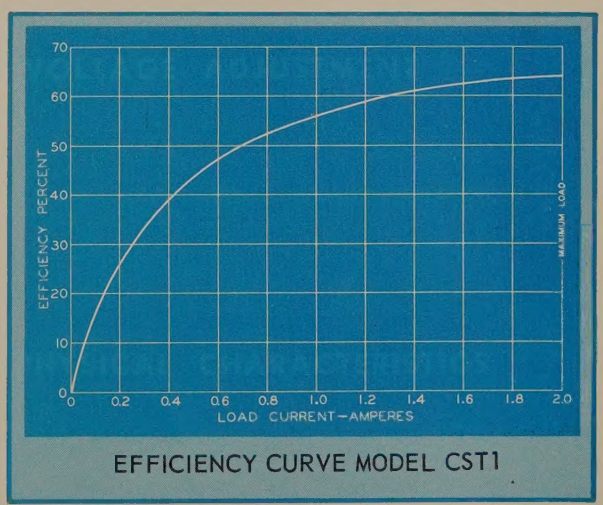
Model CST3 is 19" in width, 8-23/32" high, 13-7/8" deep and weighs 60 pounds.

In all models the forward extension when relay rack mounted is less than 5 inches from the rack mounting surface.

EFFICIENCY

The efficiency of Model CST1 is about 50% at one-third of rated load and about 65% at full load as shown in Figure 5, while that of Model CST2 is about 44% at 30% of rated load and about 55% at full load.

The efficiency of Model CST3 is excellent, being about 63% at one-third load and about 76% at full load.



EFFICIENCY CURVE MODEL CST1

FIGURE 5

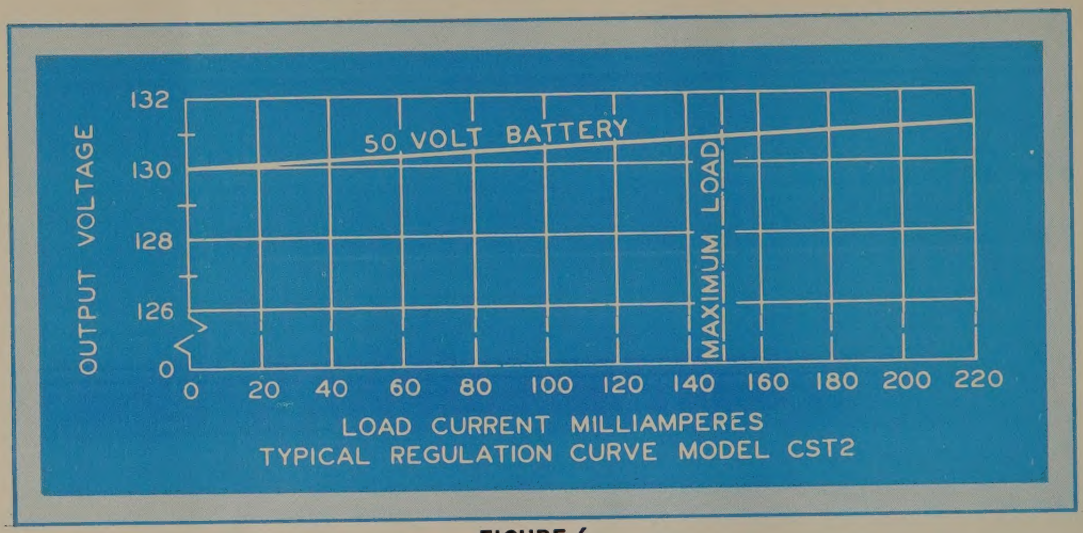
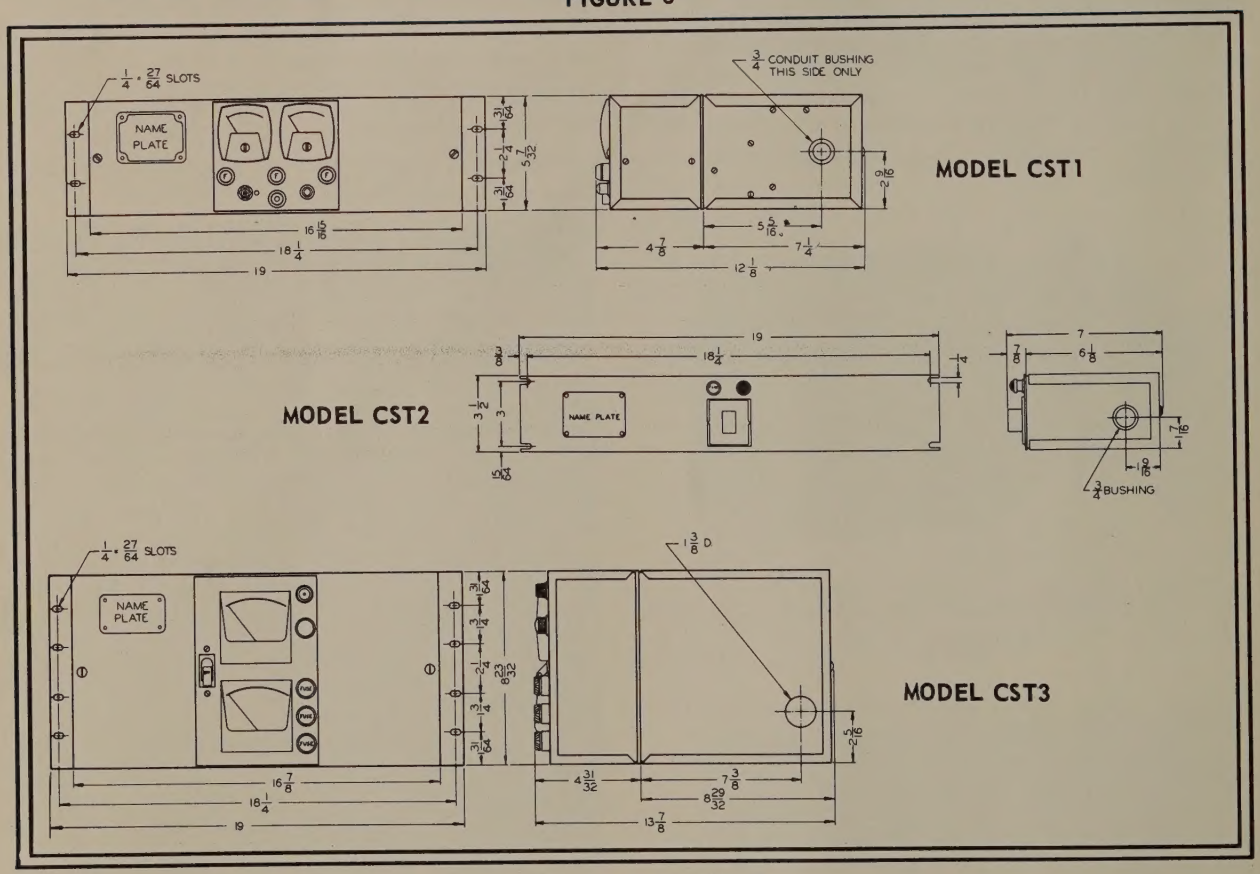


FIGURE 6



OVERALL DIMENSIONS

Model	Input Volts	Input Amps No Load	Input Amps Full Load	Output Volts	Output Amps	Width	Height	Forward Extension From Rack	Weight
CST1	48 d-c	1.5	9.0	130 d-c	2.00	19"	5-7/32"	4-7/8"	30 lbs.
CST2	48 d-c	.150	0.8	130 d-c	.150	19"	3-1/2"	7/8"	19 lbs.
CST3	48 d-c	2.0	17.0	130 d-c	5.00	19"	8-23/32"	4-31/32"	60 lbs.

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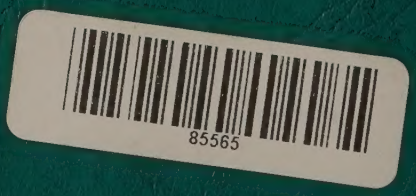
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